Figure 5-11

HYDRO-ORIENTED ACTIONS:

INTENDED AND ASSOCIATED EFFECTS

Actions involving operations or changes to dams or other water control facilities

Intended Effects for Fish and Wildlife

- Connectivity of riparian and wetland habitats
- Erosion control measures
- Create replacement habitat

- Increase aquatic habitat volume, area, and quality through dam modifications and changes in operations
- Control water quality, fish passage, and in-reservoir storage
- Reservoir drawdown
- Altered river flows—daily and seasonally
- Altered water withdrawal
- Modified streambeds and stream banks
- Changes in channel morphology from reduced sediments downstream

- Increase survival of targeted species by improved aquatic habitat and migration conditions
- Changes in reservoir and diversion operations
- Changes in hydrosystem facilities
- Changes in fish numbers, species composition, and distribution
- Trucking or barging of fish
- Hatchery management

Associated Side Effects on Humans

Possible adverse effects

- Emissions from replacement energy generation facilities
- Pollution control devices
- Dust

Mitigation measures

- Shift to thermal generation or renewable resources
- Increase power imports or reduce exports
- Reduce electricity use (conservation)

Possible adverse effects

- Modified hydro operations and loss of power
- Affordable, reliable power supply
- Reduced commercial and sport fishing
- Constrained transportation and navigation
- Loss of irrigated croplands
- Reduced aluminum-producing facilities
- Reduced or delayed urban and rural development

Mitigation measures

- Hatchery production
- Facility siting considerations
- Pollution and erosion controls
- Efficient transportation practices

Possible adverse effects

- Impacts to tribal treaty rights
- Impacts to traditional cultural properties
- Impacts to culture, health, and spirituality
- Impacts to tribal employment

Mitigation measures

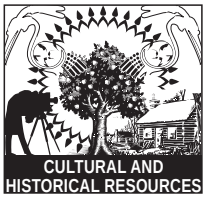
- Modify hydro operations
- Improve and expand hatcheries
- Provide compensation

Possible adverse effects

- Increased costs for irrigating farmland
- Increased costs for fish and wildlife recovery/mitigation programs
- Impact on property values
- Energy costs
- Cost of incentives for farmers to grow nonirrigated crops

Mitigation measures

- Reduce level of hydro modifications



Possible adverse effects

- Loss or exposure of archeological and historical sites

Mitigation measures

- Documentation and protection

Possible adverse effects

- Views of natural environment are disturbed

Mitigation measures

- Zoning and design criteria in land use regulations

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Figure 5-12

FORESTRY

TYPICAL ENVIRONMENTAL IMPACTS TO FISH AND WILDLIFE

Possible adverse effects:
- Habitat degradation
- Erosion
- Loss of habitat (including riparian habitat)
- Loss of habitat connectivity

Mitigation measures:
- Manage forests to benefit wildlife
- Restore harvested land to native habitat
- Improve forest structure, pattern, and species composition

Possible adverse effects:
- Runoff
- Pollution
- Sedimentation

Mitigation measures:
- Modify forestry practices to control runoff
- Close or obliterate forest roads
- Manage riparian areas for water quality

Possible adverse effects:
- Fish and wildlife population viability
- Fish and wildlife density
- Fish and wildlife diversity

Mitigation measures:
- Regulations and enforcement
- Modify harvest techniques
- Close or obliterate forest roads
- Protect lands to allow natural habitat development

Figure 5-13

TYPICAL ENVIRONMENTAL IMPACTS TO FISH AND WILDLIFE AND AGRICULTURE AND GRAZING

Possible adverse effects:
- Habitat degradation
- Erosion
- Loss of habitat and habitat connectivity
- Crops provide food source and open spaces

Mitigation measures:
- Manage range land and cropland to benefit wildlife
- Convert land to native habitat

Possible adverse effects:
- Runoff
- Water diversion
- Pollution
- Sedimentation

Mitigation measures:
- Fence out livestock
- Modify agricultural practices to control runoff
- Retire irrigated land
- Screen irrigation diversions to protect salmon

Possible adverse effects:
- Sedimentation reduces fish egg survival

Mitigation measures:
- Pollution control measures
- Buffers
- Habitat connectivity

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